

**ENGINEERING ANALYSIS**  
Kemira Water Solutions  
Facility No. 503-5007-X001  
Modification of the Specialty Chemical Unit

On May 14, 2018, the Department received an Air Permit application from Kemira Water Solutions in Mobile, Alabama. In the application, Kemira also requested a meeting with the Department, which was held on June 12, 2018. In this meeting, additional information was requested by the Department and received on June 22, 2018. More information was requested on July 18, 2018 and received on July 19, 2018.

Kemira plans to expand the production at the facility by constructing a new Bio-acrylamide (BIO AMD) production unit to support the Polyacrylamide (PAM) Emulsions and Solutions production unit (X001) currently operating at the facility. Both units would operate as batch processes. There would be new raw materials introduced with this modification. Other units under the current permits X004 and X005 would not be affected by this modification.

There would also be new storage tanks and loading/unloading stations installed with this modification as well as the installation of an emergency generator (U31) (diesel fired) rated at 762 hp (500 kW). There is one existing emergency generator, (U29) (94 hp and gas fired) and one existing fire pump, (U30) (240 hp and diesel fired) at the facility that are not permitted.

**SMOP**

Kemira is currently permitted as a synthetic minor source. Kemira has taken restrictions limiting the emissions from the entire facility to below the significance threshold (100 TPY) for all criteria pollutants. Kemira has also taken restrictions limiting the HAP emissions from the facility to below 10 TPY for any single HAP and less than 25 TPY for total HAPs. The proposed activity would have no effect on the existing limitations for the facility. This change would be incorporated into the Emissions Master calculations and would continue to be reported quarterly to the Department.

**Control Equipment**

Three new scrubbers would be installed with the construction of the new BIO AMD unit. These scrubbers would be used on the BIO AMD unit as well as the existing PAM emulsions and solution unit due to new raw material produced by and received from the BIO AMD unit. The scrubbers are identified as V-11-0103 (Acrylamide Process), V-11-0105 (EPAM Process), and V-11-0106 (Acrylamide Storage Tanks). Kemira has claimed a 90% removal efficiency for all three scrubbers. Kemira will demonstrate compliance for the three scrubbers once construction and testing are completed.

**Emissions**

This modification would not affect Kemira's facility-wide potential to emit (PTE). It is noted that the current annual 12-month rolling total plant wide emissions are 3.34 tons/year of total HAPs and 44.98 tons/year of VOCs based on the first quarter 2018 SMOP report.

Kemira has estimated the plant-wide actual emissions after this modification to be 72.6 tons of VOC and 4.74 tons of HAPs based on a 12-month rolling total. It is noted that 41 tons of these VOCs are fugitive emissions.

Kemira uses Mitchell Scientific, Inc, Emission Master (EM) and Emission Accountant (EA) software to calculate the PTE for the processes. The fugitive emissions were determined by using the EPA Method 21 protocols for approximately 4,500 components that includes valves, flanges, pumps, open-ended lines, agitators, etc. using a photoionization detector (PID). The internal leak detection was set at 100 ppm. None of the leaks detected were above the EPA threshold of 500 ppm. The fugitive PTE for the site were then calculated based on EPAs non-leaking factors.

### **NSPS**

The New Source Performance Standards (NSPS) for the Standards of Performance for Equipment Leaks of VOC in Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After November 7, 2006 (NSPS, Subpart VVa) would be applicable for the acrylamide production unit. Kemira would be required to identify all equipment (as listed in the subpart under §60.482.1a through §60.482-8a and §60.482-10a through §60.482-11a) that operates in light liquid service, heavy liquid service, and/or gas/vapor service and comply with the test method and procedures as referenced in §60.485a. Kemira would also comply with the recordkeeping requirements (§60.486a) and the reporting requirements (§60.487a) of this subpart.

The New Source Performance Standards for Volatile Organic Liquid (VOL) Storage Vessels (NSPS, Subpart Kb) would be applicable for the two new storage tanks (TA-01-1106 and TA-01-1107) because their capacities are greater than or equal to 75 m<sup>3</sup> (19,815 gallons) but less than 151 m<sup>3</sup> (39,894 gallons) storing a Volatile Organic Liquid (VOL) with a maximum true vapor pressure less than 15.0 kPa (2.17 psia). Both storage tanks have a capacity of 35,000 gallons storing a VOL with a vapor pressure of 2.03 psia.

The New Source Performance Standard (NSPS), Subpart IIII “Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI ICE)” would be applicable to the new generator (U31) since the stationary CI ICE would be constructed after July 11, 2005 as stated in 40 CFR 60.4200 (a)(2). Under this subpart, the date of construction is the date the engine is ordered by the owner or operator per 40 CFR 60.4200 (a). The generator is described as an emergency generator U31 (762 HP).

The new emergency generator (U31) is subject to the emission standard for new non-road CI engines in 40 CFR 60.4205(b)(2). Kemira must comply with the applicable record keeping, fuel requirements, and the operation and maintenance requirements of NSPS, Subpart IIII. Kemira would be required to comply with the emission standards found 40 CFR 89.112 and 40 CFR 89.113 as stated in 40 CFR 60.4202(a)(2). Kemira shall purchase fuel for these engines that meets the fuel requirements of 40 CFR 80.510(b) (i. e. 15 ppm maximum sulfur content) as stated in 40 CFR 60.4207(b). Also, this emergency generator shall install and operate a non-resettable hour meter prior to startup as stated in 40 CFR

60.4209(a). The compliance requirements for this emergency engine include maintenance checks and readiness testing that is limited to 100 hours per year as stated in 40 CFR 60.4211(f). This emergency engine may operate up to 50 hours per year in non-emergency situations, but those 50 hours are counted towards the 100 hour per year provided for maintenance and testing. An initial notification is not required to be submitted by the owner for this engine as noted in 40 CFR 60.4214(b). It is noted that there is no limit of the hours of operation for this engine during an emergency situation.

For the existing emergency generator (U29), it would be subject to the New Source Performance Standard (NSPS), Subpart JJJJ "Standards of Performance for Stationary Spark Internal Combustion Engines (SI ICE)" as stated under 40 CFR 60.4230(a)(5) since this generator was constructed after June 12, 2006. This engine would meet the requirements of 40 CFR 60.4243(d)(1) through (d)(3). The compliance requirements for this emergency engine include maintenance checks and readiness testing that is limited to 100 hours per year as stated in 40 CFR 60.4243(d)(2). This emergency engine may operate up to 50 hours per year in non-emergency situations, but those 50 hours are counted towards the 100 hour per year provided for maintenance and testing as stated in 40 CFR 60.4243(d)(3). Also, since this emergency engine fires natural gas, propane may be used as an alternative fuel solely during emergency operations for a maximum of 100 hours per year as stated in 40 CFR 60.4241(e). A performance test may be required if propane is used more than the 100 hours per year. It is noted that there is no limit of the hours of operation for this engine during an emergency situation and that there is a non-resettable hour meter installed.

For the existing emergency fire pump (U30), it would be subject to the New Source Performance Standard (NSPS), Subpart IIII "Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI ICE)" as stated under 40 CFR 60.4200(a)(4). This fire pump would comply with the emission standards in Table 4 of this subpart as stated in 40 CFR 60.4205(c) for all pollutants. This engine would meet the fuel requirements of 40 CFR 80.510(a) (i. e. 15 ppm maximum sulfur content) as stated in 40 CFR 60.4207(a). The compliance requirements for this emergency engine include maintenance checks and readiness testing that is limited to 100 hours per year as stated in 40 CFR 60.4211(f)(2). This emergency engine may operate up to 50 hours per year in non-emergency situations, but those 50 hours are counted towards the 100 hour per year provided for maintenance and testing as stated in 40 CFR 60.4211(f)(3). It is noted that there is no limit of the hours of operation for this engine during an emergency situation and that there is a non-resettable hour meter installed.

The New Source Performance Standard for Volatile Organic Compound Emissions from Synthetic Organic Chemicals Manufacturing Industry Reactor Processes (Subpart RRR) would not be applicable to the new BIO AMD production unit because it is a batch process.

No regulations listed in the New Source Performance Standards (40 CFR Part 61) would potentially apply to this project since there are no vessels that would store any material that would cause it to be subject to any regulation found in 40 CFR Part 61.

### **NESHAPS**

The generator (U-31) is subject to Subpart ZZZZ of Part 63 "National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE)" since it meets the definition of stationary RICE located at an area source per 40 CFR 63.6590(a)(2)(iii). The compliance date for new engines is June 12, 2006 and the new engines must comply at startup.

This engine (U-31) is a new emergency stationary RICE because it would be constructed after June 12, 2006. This engine will comply with the Subpart ZZZZ requirements by meeting the requirements of 40 CFR 60, Subpart IIII as stated in 40 CFR 63.6590(c)(1). No other requirements would apply under Subpart ZZZZ.

The existing emergency generator (U29) and the existing emergency fire pump (U30) are not subject to Subpart ZZZZ as stated in 40 CFR 63.6585(f) since they both meet the definition of an emergency engine as defined in 40 CFR 63.6675 and would operate according to the requirements stated in 40 CFR 63.6640(f).

The National Emission Standard for Hazardous Air Pollutants for Chemical Manufacturing Area Sources (Subpart VVVVVV) would not be applicable to the new BIO AMD production unit because there are no chemicals used by Kemira that are listed in Table 1 of the Rule that exceed the specified concentrations.

### **Control of Organic Emissions**

The requirements of ADEM Administrative Code, 335-3-6-.03, Loading and Storage of VOC, would be applicable to the two storage tanks TA-01-1106 and TA-01-1107 since the vapor pressure of the VOC to be stored is greater than 1.5 psia. These tanks would be equipped with vapor recovery systems.

The ADEM Administrative Code 335-3-6-.03 would not apply to any off-loading processes and any other storage vessels.

### **PSD**

Kemira is currently considered a synthetic minor source with respect to PSD. The change in emissions associated with this modification would not cause the facility to exceed its synthetic minor limit for any pollutant. Therefore, a PSD review would not be required.

### **Coastal Consistency / Class I**

No construction would occur on the property that is below the 10 foot contour line; therefore, the Coastal Branch of ADEM was not contacted concerning this modification. Kemira is located greater than 100 km from the nearest Class I Area (Breton). Since there would not be an increase in emissions, there should be no impact on any Class I area.

### **Air Toxics**

No significant amount of air toxics would be emitted as a result of this modification; therefore, an air toxics review would not be required.

### Odor

Since there would not be a significant increase in emissions, the Department does not believe that odors would be an issue from this modification since there would be control devices used in the process.

### Recommendation

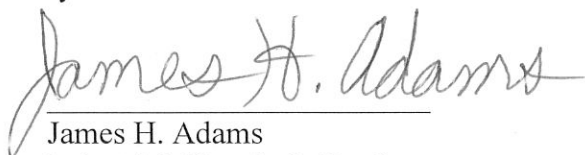
After a 15 day public notice, a response to comments, if required, and upon receipt of fees, I recommend that the following Synthetic Minor Air Permits be re-issued (X001) and issued (X022) to this facility subject to the attached provisos.

503-5007-X001      Specialty Chemicals Unit Including Railcar Loading/Unloading Stations, Tank Truck Loading/Unloading Stations, Packaging Stations, Bio-acrylamide Production Unit, and Associated Storage Tanks.

503-5007-X022      Emergency Generators and Emergency Fire Pump.

Generator (Admin/Guard 94 HP) (U29) – Natural Gas Fired  
Generator (762 HP) (U31) – Diesel Fired  
Fire Pump (240 HP) (U30) – Diesel Fired (240 hp)

These recommendations are based on the emission limits meeting all applicable state and federal regulations for this application. However, it should be noted that emissions associated with this project should be taken into account in maintaining the facility's synthetic minor source status.



James H. Adams  
Industrial Chemicals Section  
Chemical Branch  
Air Division

August 20, 2018

Date